DETAILED ACTION

Claim Rejections - 35 USC § 112

Claims 9-15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Specifically, the recitation of "the substrate" in line 11 of claim 9, in line 11 of claim 12, and in 11 of claim 15, is indefinite because it is not entirely clear which substrate is being referenced, since each claim previously indicates an array substrate and an opposing substrate. For examination purposes, examiner interprets "the substrate" to refer to either of the aforementioned substrates. Claims 10 and 11 are rejected due to dependence from claim 9, whereas claims 13 and 14 are rejected due to dependence from claim 12.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 9 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,624,860 to Narutaki et al. in view of US 6,005,646 to Nakamura et al. and in view of US 6,122,021 to Hirai et al.

Regarding claims 9 and 12, Narutaki teaches a liquid crystal display device comprising: a liquid crystal display cell comprising: an array substrate having a pixel electrode for each color of red, green, and blue arranged on the display screen in a matrix form, an opposing substrate having an opposing electrode arranged in such a manner as to face the pixel electrodes of the array substrate (all, column 3, lines 10-54), an alignment layer (column 35, lines 53-57) formed on the pixel electrode and the opposing electrode, a liquid crystal layer (column 2, lines 38-49) interposed between the array substrate and the opposing substrate, and a filter comprising a red filter layer, a green filter layer, and a blue filter layer provided on one side of the substrate, the red filter layer being arranged corresponding to the red pixel electrode, the green filter layer being arranged corresponding to the green pixel electrode, and the blue filter layer being arranged corresponding to the blue pixel electrode (column 3, lines 10-54); a phase difference plate (column 3, lines 55-59) arranged on at least one of main surfaces of the liquid crystal display cell; a pair of polarization plates (column 7, lines 29-34) arranged so as to interpose the liquid crystal display cell and the phase difference plate in the crossed-Nicol configuration (column 9, lines 17-26); and a voltage supplying source (column 2, lines 38-49), the voltage of the blue pixel electrode in black display being set to a voltage making the v' value of the u' v' chromaticity diagram become the maximum (Figure 24), and the maximum voltage of the blue pixel electrode being set to a voltage making the Z value of the XYZ stimulus value become the minimum (column 30, line 15 – column 31, line 23). Narutaki does not teach that the liquid crystal layer is arranged in bend alignment. Nakamura teaches a liquid crystal layer arranged in bend

alignment (column 1, lines 13-46). It would have been obvious to one of ordinary skill in the art at the time of the invention to arrange the liquid crystal layer of Narutaki in bend alignment, as taught by Nakamura. The motivations would have been to improve the viewing angle and motion display characteristics of the display (column 1, lines 13-46). Narutaki also does not teach that the voltage applied to the blue pixel electrode in black display is different from the voltages applied to the red and green pixel electrodes in black display. Hirai teaches a voltage applied to a blue pixel electrode in black display which is different from the voltages applied to red and green pixel electrodes in black display (column 37, lines 53-63 and column 40, lines 14-25). It would have been obvious to one of ordinary skill in the art at the time of the invention to apply a different voltage to the blue pixel electrode of Narutaki than to the red and green pixel electrodes in black display, as taught by Hirai. The motivation would have been to improve the picture quality of the display due to the differences in transmittance of the different colored pixel electrodes (column 37, lines 53-63 and column 40, lines 14-25).

Claims 10 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Narutaki in view of Nakamura and in view of Hirai as applied to claims 9 and 12, respectively, above, and further in view of US 2004/0218115 to Kawana et al.

Regarding claims 10 and 13, Narutaki in view of Nakamura and in view of Hirai renders obvious the limitations of the base claims 9 and 12, respectively. Narutaki does not teach a backlight source arranged on a side of the polarization plate having light emission peeks in light wavelength regions appropriate to the red, green, and blue filter

layers, respectively, and the blue wavelength region having light emission peaks at a longer wavelength side and a shorter wavelength side with reference to 450 nm. Kawana teaches a backlight source arranged on a side of a polarization plate having light emission peeks in light wavelength regions appropriate to the red, green, and blue filter layers, respectively, and the blue wavelength region having light emission peaks at a longer wavelength side and a shorter wavelength side with reference to 450 nm (paragraphs 32, 233, and 235). It would have been obvious to one of ordinary skill in the art at the time of the invention to include the backlight of Kawana on a side of the polarization plate of Narutaki. The motivation would have been to increase the brightness of the display.

Claims 11 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Narutaki in view of Nakamura and in view of Hirai as applied to claims 9 and 12, respectively, above, and further in view of US 6,493,053 to Miyachi et al.

Regarding claims 11 and 14, Narutaki in view of Nakamura and in view of Hirai renders obvious the limitations of the base claims 9 and 12, respectively. Narutaki does not teach that the phase different plate comprises a hybrid phase difference plate and a double-axial phase difference plate. Miyachi teaches a phase different plate comprising a hybrid phase difference plate and a double-axial phase difference plate (column 11, lines 34-38). It would have been obvious to one of ordinary skill in the art at the time of the invention to include the phase difference plate comprising a hybrid phase difference plate and a double-axial phase difference plate, as taught by Miyachi, as the phase

difference plate of Narutaki. The motivation would have been to increase the functionality of the phase difference plate (column 11, lines 34-38).

Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Narutaki in view of Nakamura and in view of Hirai and in view of Miyachi.

Regarding claim 15, Narutaki teaches a liquid crystal display device comprising: a liquid crystal display cell comprising: an array substrate having a pixel electrode for each color of red, green, and blue arranged on the display screen in a matrix form, an opposing substrate having an opposing electrode arranged in such a manner as to face the pixel electrodes of the array substrate (all, column 3, lines 10-54), an alignment layer (column 35, lines 53-57) formed on the pixel electrode and the opposing electrode, a liquid crystal layer (column 2, lines 38-49) interposed between the array substrate and the opposing substrate, and a filter comprising a red filter layer, a green filter layer, and a blue filter layer provided on one side of the substrate, the red filter layer being arranged corresponding to the red pixel electrode, the green filter layer being arranged corresponding to the green pixel electrode, and the blue filter layer being arranged corresponding to the blue pixel electrode (column 3, lines 10-54); a phase difference plate (column 3, lines 55-59) arranged on at least one of main surfaces of the liquid crystal display cell; a pair of polarization plates (column 7, lines 29-34) arranged so as to interpose the liquid crystal display cell and the phase difference plate in the crossed-Nicol configuration (column 9, lines 17-26); and a voltage supplying source (column 2, lines 38-49), the voltage of the blue pixel electrode in black display being set to a

voltage making the v' value of the u' v' chromaticity diagram become the maximum (Figure 24). Narutaki does not teach that the liquid crystal layer is arranged in bend alignment. Nakamura teaches a liquid crystal layer arranged in bend alignment (column 1, lines 13-46). It would have been obvious to one of ordinary skill in the art at the time of the invention to arrange the liquid crystal layer of Narutaki in bend alignment, as taught by Nakamura. The motivations would have been to improve the viewing angle and motion display characteristics of the display (column 1, lines 13-46). Narutaki also does not teach that the voltage applied to the blue pixel electrode in black display is different from the voltages applied to the red and green pixel electrodes in black display. Hirai teaches a voltage applied to a blue pixel electrode in black display which is different from the voltages applied to red and green pixel electrodes in black display (column 37, lines 53-63 and column 40, lines 14-25). It would have been obvious to one of ordinary skill in the art at the time of the invention to apply a different voltage to the blue pixel electrode of Narutaki than to the red and green pixel electrodes in black display, as taught by Hirai. The motivation would have been to improve the picture quality of the display due to the differences in transmittance of the different colored pixel electrodes (column 37, lines 53-63 and column 40, lines 14-25). Narutaki also does not teach that the phase different plate comprises a hybrid phase difference plate. Miyachi teaches a phase different plate comprising a hybrid phase difference plate (column 11, lines 34-38). It would have been obvious to one of ordinary skill in the art at the time of the invention to include the phase difference plate comprising a hybrid phase difference plate and a double-axial phase difference plate, as taught by Miyachi, as the phase

difference plate of Narutaki. The motivation would have been to increase the functionality of the phase difference plate (column 11, lines 34-38).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JERRY BLEVINS whose telephone number is (571)272-8581. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank G. Font can be reached on 571-272-2415. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jerry M. Blevins/
Examiner, Art Unit 2883

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FGF/JMB
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